PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS

Serial No.:	**10/535,487**
Inventors/Applicants:	Gerard Vincent Monaghan et. al.
Assignee:	ETX Systems Inc.
371(c) Entry Date:	May 17, 2005
Effective Filing Date:	October 26, 2004
Priority Date:	October 27, 2003
Title:	PROCESS FOR CONVERTING A LIQUID FEED MATERIAL INTO A VAPOR PHASE PRODUCT
Group Art Unit:	1797
Confirmation No.:	3934
Examiner:	Randy Boyer
Entity Status:	Small Entity
Our Docket:	RR-584 PCT/US

TO: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF UNDER 37 C.F.R. §41.37

Sir:

A Final Office Action with respect to this Application was issued by the USPTO on October 5, 2009, rejecting current pending Claims 2 – 23 and 25 - 26.

A "First Appeal" was commenced by the Appellant in response to the Final Office Action dated October 5, 2009. The following documents pertain to the First Appeal:

(a) a first Notice of Appeal filed by the Appellant on January 5, 2010;

(b) a first Appellant's Brief filed by the Appellant on March 5, 2010;

(c) a Letter Regarding Appellant's Brief filed by the Appellant on March 18, 2010;

(d) a Notification of Non-Compliant Appeal Brief issued by the USPTO on March 22, 2010; and

(e) a Response to Notification of Non-Compliant Appeal Brief filed by the Appellant on March 31, 2010.

A non-Final Office Action with respect to this Application was issued by the USPTO on July 8, 2010, reopening the prosecution of this Application on the merits and rejecting current pending Claims 2 - 26.

A "Second Appeal" has been commenced by the Appellant in response to the non-Final Office Action dated July 8, 2010, in accordance with MPEP 1207.04. The following documents pertain to the Second Appeal thus far:

(a) a second Notice of Appeal which is filed contemporaneously with this second Appellant's Brief; and

(b) this second Appellant's Brief.

A $270.00 (small entity) Notice of Appeal fee was paid by the Appellant pursuant to 37 C.F.R. §41.20(b)(1) at the time of filing of the first Notice of Appeal on March 5, 2010. A $270.00 (small entity) Appeal Brief fee was paid by the Appellant pursuant to 37 C.F.R. §41.20(b)(2) at the time of filing of the first Appellant's Brief on March 5, 2010.

We respectfully request that all fees which have been paid by the Appellant to the USPTO in connection with the First Appeal be applied towards the fees which are payable for the Second Appeal. In particular, we respectfully request that the previously paid Notice of Appeal fee relating to the first Notice of Appeal and the previously paid Appeal Brief fee relating to the first Appellant's Brief be applied toward the second Notice of Appeal and the second Appellant's Brief respectively.

Please charge any additional required fees in connection with the filing of the second Notice of Appeal and this second Appellant's Brief, to our Deposit Account No. 18-1743.

1. REAL PARTY IN INTEREST

The real party in interest is the assignee of record, ETX Systems Inc.

2. RELATED APPEALS AND INTERFERENCES (i.e. RELATED PROCEEDINGS)

There are no prior and pending appeals, interferences or judicial proceedings known to the Appellant or the Appellant's legal representative which may be related to, directly affect or be directly affected by or having a bearing on the Board's decision in this Appeal.

3. STATUS OF CLAIMS

Claim 1 has been cancelled. Claims 2 - 26 are currently pending in this Application.

Claims 2 - 26 were rejected in the non-Final Office Action dated July 8, 2010. This Appeal is directed at Claims 2 - 26.

A copy of the Claims appears in the CLAIMS APPENDIX commencing on page 25 of this Appellant's Brief.

4. STATUS OF AMENDMENTS

No amendments have been made to the Claims since the issuance of the non-Final Office Action dated July 8, 2010.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 26 is an independent claim. Claims 2 - 25 all depend directly or indirectly from independent Claim 26. References in this Appellant's Brief to page numbers of the Application are references to the Application "as filed" by the Appellant. References in this Appellant's Brief to the Claims are references to Claims 2 – 26 as currently pending.

The process as claimed in independent Claim 26 is directed at a process for converting a liquid feed material (40) into a vapor phase product (44) comprising the following:

(a) providing a fluid bed (30) comprising solid particles (28) and a fluidizing medium (22), **wherein providing the fluid bed (30) is comprised of introducing the solid particles (28) to the fluid bed (30) at an upstream horizontal position in the fluid bed (30)**, wherein providing the fluid bed (30) is further comprised of introducing the fluidizing medium (22) to the fluid bed (30) so that the fluidizing medium (22) is moving in a substantially vertical fluidizing direction, and wherein the solid particles (28) are at a conversion temperature which is suitable for facilitating the conversion of the liquid feed material (40) to the vapor phase product (44);

(b) moving the solid particles (28) in a substantially horizontal solid transport direction (32) from the upstream horizontal position to a downstream horizontal position;

(c) **introducing the liquid feed material (40) directly to the fluid bed (30), separately from the solid particles (28)** and separately from the fluidizing medium (22), **at a feed zone located between the upstream horizontal position and the downstream horizontal position** in order to facilitate the conversion of the liquid feed material (40) into the vapor phase product (44);

(d) maintaining the solid particles (28) as fluidized solid particles in the feed zone by introducing the fluidizing medium (22) to the fluid bed (30) in the feed zone; and

(e) collecting the vapor phase product (44).

(Page 7, lines 16 - 33; Page 8, lines 13 - 15; Page 8, lines 28 - 34; Page 9, line 28 - Page 10, line 16; Page 11, line 17 - Page 12, line 11; Page 13, line 8 - Page 14, line 14; Page 17, lines 4 - 26; and Figures 1 and 2 of the Application).

Thus, a fluid bed (30) is provided which is defined as comprising the solid particles (28) and the fluidizing medium (22), wherein providing the fluid bed (30) is comprised of introducing the solid particles (28) to the fluid bed (30) at an upstream horizontal position. Further, the solid particles (28) are moved in the fluid bed (30) in the substantially horizontal solid transport direction (32) from the upstream horizontal position to the downstream horizontal position.

The liquid feed material (40) is introduced **DIRECTLY to the fluid bed** (30), **SEPARATELY from the solid particles (28)**, at the **feed zone (62)**, wherein the feed zone (62) is located **between** the upstream and downstream horizontal positions.

As described in further detail in the Application at Page 9, line 28 - Page 10, line 2:

> "In a preferred process aspect of the invention, a fluidizing medium such as a gas is introduced into a reactor to fluidize a bed of solid particles such that the fluidizing medium is moving in a substantially vertical fluidizing direction. The solid particles are transported substantially horizontally in a solid transport direction from a solids inlet at an upstream horizontal position in the reactor to a solids outlet at a downstream horizontal position in the reactor, preferably but not necessarily by the force of gravity. **As the solid particles move through the reactor** they are contacted by a liquid feed material comprising a liquid hydrocarbon. The liquid hydrocarbon is introduced into the reactor **at a feed zone** which is located **downstream of the solids inlet**."

Further, referring to Figures 1 and 2, Page 11, line 23 - Page 12, line 3 of the Application states:

> "The fluidizing medium (22) fluidizes solid particles (28) to produce a fluid bed (30). The solid particles (28) in the fluid bed (30) move in a substantially horizontal solid transport direction (32) from a solids inlet (34) at an upstream horizontal position to a solids outlet (36) at a downstream horizontal position. The solid particles (28) are collected in a solid collection apparatus (38) which is associated with the solids outlet (36)."

> "A liquid feed material (40) is introduced into the reactor (20) at a feed inlet (42) which is located downstream of the solids inlet (34) so that the feed inlet (42) is between the solids inlet (34) and the solids outlet (36)."

Thus, as shown in Figures 1 and 2 of the Application, the reactor (20) is divided into a number of zones, including a solid feed zone (60) and a liquid feed zone (62), each having a different function (Page 13, lines 10 - 14 of the Application). The liquid feed zone (62) is located downstream of the solid feed zone (60). Further, the liquid feed material (40) is introduced in the liquid feed zone (62) directly to the fluid bed (30), the fluid bed (30) comprising the solid particles (28) fluidized by the fluidizing medium (22).

In addition, the step of introducing the liquid feed material **directly** to the fluid bed at the feed zone is further defined in dependent Claims 10 - 14. (Page 9, lines 1 - 12; and Page 18, line 13 - Page 20, line 9 of the Application).

Dependent Claim 10 claims wherein the step of introducing the liquid feed material (40) directly to the fluid bed (30) at the feed zone (62) is comprised of **spraying** the liquid feed material (40) so that the liquid feed material (40) contacts the solid particles (28) as droplets.

Dependent Claim 11 claims wherein the liquid feed material (40) is sprayed **within the fluid bed** (30) so that the droplets **penetrate the fluid bed** (30).

Dependent Claim 12 claims wherein the liquid feed material (40) is sprayed so that the droplets contact the solid particles (28) from a spraying direction which is substantially perpendicular to the solid transport direction (32).

Dependent Claim 13 claims wherein the spraying direction is a substantially vertical direction. Dependent Claim 14 claims wherein the spraying direction is substantially opposite to the fluidizing direction (26).

The liquid feed delivery is particularly described in the Application at Page 18, line 13 - Page 19, line 10. In addition, Page 19, lines 31 - 34 of the Application states that "adequate

momentum is imparted to the feed droplets to allow some penetration of the liquid feed material (40) into the fluid bed (30)."

Dependent Claim 18 further defines the step of moving the solid particles (28). In particular, Claim 18 claims wherein the solid particles (28) are moved in the solid transport direction at a rate which is significantly larger than a rate of mixing of the solid particles (28) in the solid transport direction (32).

In other words, "the Peclet (Pe) number describing the movement of the solid particles is relatively large so that the movement of the solid particles in the solid transport direction approaches plug-flow" (Page 8, lines 7 - 11; and Page 21, lines 3 - 10 of the Application).

Dependent Claim 22 further defines the "solid particles" (28). In particular, the solid particles (28) are comprised of an amount of a catalyst which is suitable for use in converting the liquid feed material (40) into the vapor phase product (44). (Page 8, lines 3 - 5; and Page 14, lines 24 - 28 of the Application).

Dependent Claim 25 further defines the process as comprising the step of collecting a vaporized fraction (51) of the liquid feed material (40) at a vapor phase product collection location (50) which is adjacent to the feed zone (62). (Page 9, lines 22 - 26 of the Application).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

In the non-Final Office Action dated July 8, 2010:

1. the Examiner rejected independent Claim 26 and dependent Claims 2 - 17 and 19 - 25 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 2,717,867 (Jewell et al); and

2. the Examiner rejected dependent Claim 18 and dependent Claim 24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,717,867 (Jewell et al).

7. ARGUMENT

The First Appeal resulted from the issuance by the USPTO of the Final Office Action dated October 5, 2009.

In the Final Office Action dated October 5, 2009, the Examiner rejected independent Claim 26 and dependent Claims 2 – 23 and 25 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,717,867 (Jewell et al), as the sole ground of rejection.

This Second Appeal results from the issuance by the USPTO of the non-Final Office Action dated July 8, 2010.

In the non-Final Office Action dated July 8, 2010, the Examiner rejected independent Claim 26, dependent Claims 2 – 17, and dependent Claims 19 – 25 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 2,717,867 (Jewell et al), and rejected dependent Claims 18 and 24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,717,867 (Jewell et al).

In the non-Final Office Action dated July 8, 2010, independent Claim 26, dependent Claims 2 – 17, dependent Claims 19 – 23 and dependent Claim 25 were NOT rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,717,867 (Jewell et al). More precisely, the sole ground of rejection of these Claims as contained in the Final Office Action dated October 5, 2009 was NOT repeated or maintained in the non-Final Office Action dated July 8, 2010.

It is therefore respectfully submitted that the sole ground of rejection in the Final Office Action dated October 5, 2009 of independent Claim 26, dependent Claims 2 – 17, dependent Claims 19 – 23 and dependent Claim 25 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 2,717,867 (Jewell et al) has been explicitly or implicitly overcome by the

arguments contained in the first Appellant's Brief which was filed on March 5, 2010 in connection with the First Appeal. Notwithstanding this submission, the Appellant hereby incorporates the entire contents of the first Appellant's Brief into this second Appellant's Brief.

With respect to the non-Final Office Action dated July 8, 2010, it is respectfully submitted that:

1. independent Claim 26 is not anticipated by U.S. Patent No. 2,717,867 (Jewell et al);

2. none of dependent Claims 2 – 17 and dependent Claims 19 – 25 are anticipated by U.S. Patent No. 2,717,867 (Jewell et al);

3. dependent Claim 18 and dependent Claim 24 are patentable over U.S. Patent No. 2,717,867 (Jewell et al); and

4. none of Claims 2 - 26 stand or fall together.

The two Grounds of Rejection in the non-Final Office Action dated July 8, 2010 are both based upon U.S. Patent No. 2,717,867 (Jewell et al).

(a) U.S. Patent No. 2,717,867 (Jewell et al)

Jewell et al is directed at an improved process for hydrocarbon conversion which involves a coking treatment performed in a drum (19), as shown in Figures 1 - 3, which maintains "a fluidized bed of coke." Further, the coking treatment involves contacting a preheated oil with hot finely divided coke in a "coking zone." (Column 2, lines 45 - 53 of Jewell et al). However, as discussed in detail below, the contacting of the oil and the coke within the coking zone takes place PRIOR to the introduction of the oil/coke mixture into the fluidized bed.

Column 3, lines 35 - 41 of Jewell et al states:

> "The hot finely divided coke **and** the preheated residual oil are discharged into the right hand end of the drum 19, preferably at a point **substantially**

> **above** the upper surface of the **fluid bed** of coke, under conditions such that the relatively vaporizable portion of the oil is rapidly vaporized and the unvaporizable portion is absorbed by the hot coke particles being introduced into drum 19."

Thus, as shown in Figures 1 - 3 of Jewell et al, the coke particles and the oil are discharged into the drum together to permit their contact above the surface of the fluid bed in order to provide for an initial vaporization of a portion of the oil. Following the initial contact between the coke particles and the oil, the remaining unvaporized oil is absorbed by the coke particles and the **combination or mixture of the coke particles and absorbed oil** falls into the fluid bed.

As further stated at Column 3, lines 42 - 48 of Jewell et al, "the relative proportions of oil and hot coke charged to drum 19 are controlled to provide sufficient absorbent surface in relation to the unvaporized portion of the oil, whereby the latter may be absorbed by the coke while the coke remains sufficiently dry that it can be fluidized by the aerating and stripping gas flowing upwardly through distribution plate 20." In other words, the particles of coke are fluidized following the absorption of the oil thereby. The coke particles are not fluidized prior to contacting the oil.

Furthermore, with reference to the preferred embodiment of Jewell et al shown in Figures 1 - 3, Column 3, lines 58 - 74 of Jewell et al states:

> "Preferably, the temperatures of the hot coke and oil charged into drum 19 and the relative proportions of each are controlled to effect rapid vaporization of the oil and absorption of unvaporized constituents, **whereby little or no liquid oil falls on the upper surface of the fluid bed of coke**. This may be effected by discharging hot finely divided coke in an aerated condition into the interior of drum 19 at a high point therein while simultaneously spraying the hot residual oil into the interior of drum 19 at a point nearby the point at which the aerated coke is being introduced. The spray of oil is **directed into** the aerated mass of coke being introduced, **to effect intimate contact of the hot coke and oil**. This produces rapid vaporization of a portion of the oil and the unvaporized portion is absorbed by the coke which is settled onto the upper surface of the fluid bed of coke distribution plate 20."

In addition, the intimate contact of the hot oil and coke, or mixing of the hot oil and

coke, is preferably achieved in a separate confined zone, referred to as the "vaporizing section" of the coking zone, "whereby part of the oil is vaporized and the unvaporized remainder is substantially completely absorbed by the hot coke, prior to discharge of the resulting mixture into drum 19 at a point from which the coke particles may settle onto the fluidized bed of coke." (Column 3, line 75 - Column 4, line 7 of Jewell et al).

The separate confined zone may be provided outside the drum (19). However, preferably, the separate confined zone is provided in the upper interior of the drum (19) by partitioning off a space around the inlets for the oil and coke. Referring to Figures 1 and 2, a partition is provided in the form of a truncated cone (24). (Column 4, lines 7 - 14 of Jewell et al). Column 4, lines 12 - 26 of Jewell et al states:

> "... a partition in the form of a truncated cone 24, open at the lower small end, is attached to the upper interior wall of drum 19. Line 17 connects with a spray head 25 mounted at the top of drum 19 and arranged to spray the hot residual oil downwardly within the vaporizing section, of the coking zone, defined by partition 24. The finely divided hot coke for the coking treatment is supplied from standpipe 26 as an aerated mass. ... The hot finely divided coke from standpipe 26 is discharged into the mixing section of the coking zone provided by partition 24 and into intimate contact with the oil being sprayed therein."

In order to assist in the mixing of the hot coke and oil within the vaporizing section of the coking zone, an extraneous gas may be directly introduced into the mixing section, such as through line (29). The tangential introduction of the extraneous gas from line (29) through inlets (30) produces a swirling movement of the coke particles and oil droplets whereby there is intimate contact of the oil and hot coke within the vaporizing section and prior to discharge of the resulting mixture of oil vapors and hot coke, through the exit (31) of the partition (24). Referring to Figure 3 of Jewell et al, the tangential inlets (30) are oriented horizontally to impart the swirling movement. (Column 4, lines 34 - 46 of Jewell et al).

As indicated above, the contact between the oil and coke particles is performed in a manner such that "little or no liquid oil falls on the upper surface of the fluid bed." This express feature of the process of Jewell et al is further confirmed at Column 4, lines 53 - 58 as follows:

> "It is preferred that vaporization of oil and absorption of the residue shall be

accomplished solely by the coke with which the oil is first contacted in the mixing zone and that substantially no unabsorbed liquid oil be precipitated onto the surface 21 of the coke bed."

(b) Test For Anticipation Under 35 U.S.C. §102(b)

It is well known that to anticipate, every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the Claim (*Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 USPQ2d 1286, 1291 (Fed. Cir. 2001); *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 1567, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991)).

An anticipating reference must describe all of the elements and limitations of the Claim in a single reference, and enable one of skill in the field of the invention to make and use the claimed invention (*Bristol-Myers Squibb Co. v. Ben Venue Labs, Inc.*, 246 F.3d 1368, 1378-79 (Fed. Cir. 2001); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226 (Fed. Cir. 1989)).

It is respectfully submitted that Jewell et al does not fulfill the requirements for anticipation of Claims 2 – 17 and Claims 19 – 26 under 35 U.S.C. §102(b).

(c) Test For Obviousness Under 35 U.S.C. §103(a)

As discussed in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (2007), the determination of obviousness under 35 U.S.C. 103 is a legal conclusion based on factual evidence. The legal conclusion that a claim is obvious depends upon at least four underlying factual issues, as set forth in *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966): (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) evaluation of any relevant secondary considerations.

Therefore, it is submitted that the test for obviousness must take into consideration the invention as a whole; that is, one must consider the particular problem solved by the combination of elements that define the invention. *Interconnect Planning Corp. v. Feil*, 227 USPQ 543 (Fed. Cir. 1985); *Manual of Patent Examining Procedure* §2143.02. The Examiner

must, as one of the inquiries pertinent to any obviousness inquiry under 35 U.S.C. 103 recognize and consider not only the similarities but also the critical differences between the claimed invention and the prior art. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990). Moreover, the Examiner must avoid hindsight.

It is respectfully submitted that the teachings of Jewell et al do not render dependent Claim 18 and dependent Claim 24 unpatentable.

(d) Independent Claim 26

As described above, Jewell et al describes a two stage coking process which is carried out on a preheated residual liquid oil from a fractionating tower (15).

In the first stage of the coking process, hot coke particles are mixed with the preheated residual liquid oil in a vaporizing section of a coking zone, under conditions such that the relatively vaporizable portion of the residual oil is rapidly vaporized and the unvaporizable portion is absorbed by the hot coke particles (Column 3, lines 35 - 41 of Jewell et al).

In the second stage of the coking process, the hot coke particles containing absorbed residual hydrocarbons from the vaporizing section are introduced into a soaking section of the coking zone, which includes a drum (19) containing a fluid bed (21) so that the coke particles are precipitated onto the fluid bed (21) (Column 5, lines 14 - 24 of Jewell et al). Sufficient residence time of the coke particles is provided in the fluid bed (21) to complete the coking of the residual hydrocarbons which are absorbed onto the coke particles (Column 5, lines 35 - 40 of Jewell et al).

The first stage of the coking process (i.e., the vaporizing section of the coking zone) is described extensively at Column 3, line 35 to Column 5, line 13 of Jewell et al, and is interchangeably referred to as the "mixing and absorbing zone" (Column 4, line 8 of Jewell et al), the "mixing section" (Column 4, line 24; Column 4, lines 36 - 37; and Column 4, line 39 of Jewell et al), the "mixing zone" (Column 4, line 56 of Jewell et al), the "mixing and vaporizing zone" (Column 4, line 74 of Jewell et al) and the "confined mixing zone" (Column 5, lines 8 - 9 of Jewell et al). The vaporizing section of the coking zone is also depicted in Figure 3 of Jewell et al.

The hot coke particles are introduced into the upper end of the vaporizing section partition (24) through branch lines (28). The residual oil is introduced into the upper end of the vaporizing section partition (24) through line (17) and spray head (25), and the spray of the residual oil is directed into the hot coke particles to "effect intimate contact" of the hot coke and oil (Column 3, line 70; and Column 4, lines 25 -2 6 of Jewell et al). The vaporizing zone is configured to "promote intimate mixing" of the hot coke particles and the residual oil (Column 4, line 27 of Jewell et al). The "mixing" of the hot coke particles and the residual oil within the vaporizing section of the coking zone may be assisted by introducing extraneous gas directly into the "mixing section" (Column 4, lines 34 - 37 of Jewell et al), producing a "swirling movement" of the hot coke particles and the residual oil droplets whereby there is "intimate contact" of the hot coke particles and the residual oil within the vaporizing section (Column 4, lines 41 - 44 of Jewell et al).

The hot coke particles with residual hydrocarbons absorbed thereon are removed from the vaporizing section partition (24) via exit (31) which is located at the bottom of the vaporizing section partition (24).

The second stage of the coking process is described extensively at Column 5, line 14 to Column 6, line 30 of Jewell et al. The soaking section of the coking zone is depicted in Figure 1 and Figure 2 of Jewell et al. The hot coke particles with residual hydrocarbons absorbed thereon are precipitated upon the fluid bed (21) after being discharged from the exit (31) of the vaporizing section partition (24). The fluid bed (21) of coke particles moves laterally toward a withdrawal passageway (32), providing a uniform residence time of the coke particles in the fluid bed, thereby facilitating a completion of the coking of the residual hydrocarbons which are absorbed on the hot coke particles.

It is clear that in Jewell et al, the residual oil and the hot coke particles are introduced to the fluid bed (21) TOGETHER after being discharged from the first stage of the coking process.

With respect to independent Claim 26, on pages 3-4 of the non-Final Office Action dated July 8, 2010 the Examiner asserts that Jewell et al discloses a process which comprises:

"...(c) introducing the liquid feed material (supplied via process line (17)) directly[1] to the fluid bed (21) at a feed zone located between the upstream horizontal position and the downstream horizontal position in order to facilitate the conversion of the liquid feed material into the vapor phase product (see Jewell, Fig. 1 and Fig. 2)...".

In Footnote 1 to the above passage, the Examiner asserts as follows:

"[1] Jewell clearly discloses that a portion of the oil coming into contact with the solid particles remains "unvaporized" (see Jewell, column 3, lines 70-72). Jewell explains that "*the unvaporized portion* is *absorbed by the coke which is [then] settled onto the upper surface of the fluid bed of coke distribution plate 20*" (see Jewell, column 3, lines 70-74) (emphasis added). Thus, Jewell provides clear disclosure for "introducing the *liquid* feed material *directly* to the fluid bed.""

As a first point with respect to independent Claim 26, it is respectfully submitted that the conclusion by the Examiner that Jewell provides clear disclosure for "introducing the *liquid* feed material *directly* to the fluid bed." is not supported by a fair reading of both Jewell et al and independent Claim 26.

In Jewell et al, the liquid feed material is NOT introduced directly to the fluid bed (21), but is introduced indirectly to the fluid bed (21) via the hot coke particles as a result of being absorbed onto the hot coke particles. In addition, in Jewell et al, the entire liquid feed material is not introduced to the fluid bed (21), but only the unvaporized portion of the liquid feed material is introduced to the fluid bed (21).

As a second point with respect to independent Claim 26, in the discussion of Claim 26 in the non-Final Office Action dated July 8, 2010, the Examiner OMITS any reference to the following important underlined limitation of independent Claim 26:

(c) introducing the liquid feed material directly to the fluid bed, separately from the solid particles and separately from the

fluidizing medium, at a feed zone located between the upstream horizontal position and the downstream horizontal position in order to facilitate the conversion of the liquid feed material into the vapor phase product;

It is respectfully submitted that Jewell et al does not disclose or describe introducing the liquid feed material: "...separately from the solid particles...", since the unvaporized portion of the liquid feed material is introduced to the fluid bed (21) TOGETHER WITH THE HOT COKE PARTICLES as a result of being absorbed onto the hot coke particles.

As a third point with respect to independent Claim 26, the analysis and characterization of Jewell et al by the Examiner in the non-Final Office Action dated July 8, 2010 is inconsistent with the following important underlined limitations of independent Claim 26:

(a) providing a fluid bed comprising solid particles and a fluidizing medium, wherein providing the fluid bed is comprised of introducing the solid particles to the fluid bed at an upstream horizontal position in the fluid bed, wherein providing the fluid bed is further comprised of introducing the fluidizing medium to the fluid bed so that the fluidizing medium is moving in a substantially vertical fluidizing direction, and wherein the solid particles are at a conversion temperature which is suitable for facilitating the conversion of the liquid feed material to the vapor phase product;

(c) introducing the liquid feed material directly to the fluid bed, separately from the solid particles and separately from the fluidizing medium, at a feed zone located between the upstream horizontal position and the downstream horizontal position in order to facilitate the conversion of the liquid feed material into the vapor phase product;

It is clear in Jewell et al that since the hot coke particles are introduced to the fluid bed (21) TOGETHER WITH the unvaporized portion of the liquid feed material, the solid particles cannot be introduced to the fluid bed at the upstream horizontal position while the liquid feed material is simultaneously introduced to the fluid bed at a feed zone which is between the upstream horizontal position and the downstream horizontal position.

In summary with respect to independent Claim 26, it is respectfully submitted that Jewell et al does NOT disclose or describe AT LEAST the following underlined limitations of independent Claim 26 (annotations added):

> 26. A process for converting a liquid feed material into a vapor phase product comprising the following steps:
>
> (a) providing a fluid bed comprising solid particles and a fluidizing medium, wherein providing the fluid bed is comprised of introducing the solid particles to the fluid bed at an upstream horizontal position in the fluid bed [THIRD POINT], wherein providing the fluid bed is further comprised of introducing the fluidizing medium to the fluid bed so that the fluidizing medium is moving in a substantially vertical fluidizing direction, and wherein the solid particles are at a conversion temperature which is suitable for facilitating the conversion of the liquid feed material to the vapor phase product;
>
> (b) moving the solid particles in a substantially horizontal solid transport direction from the upstream horizontal position to a downstream horizontal position;
>
> (c) introducing the liquid feed material directly to the fluid bed [FIRST POINT], separately from the solid particles [SECOND POINT] and separately from the fluidizing medium, at a feed zone located between the upstream horizontal position and the downstream horizontal position [THIRD POINT] in order to

facilitate the conversion of the liquid feed material into the vapor phase product;

(d) maintaining the solid particles as fluidized solid particles in the feed zone by introducing the fluidizing medium to the fluid bed in the feed zone; and

(e) collecting the vapor phase product.

It is therefore respectfully submitted that independent Claim 26 is not anticipated by Jewell et al.

(e) Dependent Claims 2 - 23 and 25

Dependent Claims 2 - 6

Claims 2 to 6 further define the step of collecting the vapor phase product and the regeneration of the solid particles after the collecting step. Claims 2 to 6 depend directly or indirectly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claims 2 to 6 are also not anticipated by Jewell et al.

Dependent Claims 7 - 8

Claims 7 and 8 further define the step of moving the solid particles in the substantially horizontal solid transport direction. Claims 7 and 8 depend directly or indirectly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claims 7 and 8 are also not anticipated by Jewell et al.

Dependent Claim 9

Claim 9 further defines the step of providing the fluid bed. Claim 9 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 9 is also not anticipated by Jewell et al.

Dependent Claims 10 - 14

Claim 10 depends from independent Claim 26 and further defines the step of "introducing the liquid feed material directly to the fluid bed at the feed zone" as being "comprised of spraying the liquid feed material so that the liquid feed material contacts the solid particles as droplets."

As described previously, the liquid feed material of the Appellant's process is introduced directly to the fluid bed, separately from the solid particles, at the feed zone. Thus, pursuant to Claim 10, the liquid feed material is sprayed directly into the fluid bed at the feed zone.

In contrast, Jewell et al does not spray the liquid feed material (oil) directly into the fluid bed, but rather, sprays the liquid feed material onto the solid particles (coke particles) above the fluid bed, prior to introduction to the fluid bed. Furthermore, the tangential inlets (30) introduce an extraneous gas into the mixing section, which produces a swirling movement of the coke particles and the oil droplets, further inhibiting or preventing the oil droplets from being introduced directly to the fluid bed.

Claim 11 depends from Claim 10 and further claims "wherein the liquid feed material is sprayed within the fluid bed so that the droplets penetrate the fluid bed."

As discussed above with respect to Claim 10, Jewell et al does not spray the liquid feed material (oil) directly into the fluid bed, but rather, sprays the liquid feed material onto the solid particles (coke particles) ABOVE the fluid bed, prior to introduction to the fluid bed.

Claims 12 to 14 depend directly or indirectly from Claim 10 and further define a spraying direction of the droplets of the liquid feed material.

Claim 12 claims "wherein the liquid feed material is sprayed so that the droplets contact the solid particles from a spraying direction which is substantially perpendicular to the solid transport direction." The "solid transport direction" is defined by the Appellant in Claim 26 as the direction of movement of the solid particles in the fluid bed.

Claim 13 claims "wherein the spraying direction is a substantially vertical direction." Claim 14 claims "wherein the spraying direction is substantially opposite to the fluidizing direction." The "fluidizing direction" is defined by the Appellant in Claim 26 as the direction of introducing the fluidizing medium to the fluid bed.

As discussed above with respect to Claim 10, Jewell et al does not spray the liquid feed material into the fluid bed, but rather into a vaporizing section above the fluid bed. Thus, Jewell et al does not disclose or describe in any manner a direction of spray of the liquid feed material directly into the fluid bed.

Finally, Claims 10 - 14 depend directly or indirectly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claims 10 - 14 are also not anticipated by Jewell et al.

Dependent Claim 15

Claim 15 defines the process as further comprising the step of quenching the vapor phase product. Claim 15 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 15 is also not anticipated by Jewell et al.

Dependent Claims 16 - 17

Claims 16 and 17 define the process as further comprising the step of collecting the fluidizing medium, and separating the collected fluidizing medium. Claims 16 and 17 depend directly or indirectly from independent Claim 26, which the Appellant has shown not to be

anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claims 16 and 17 are also not anticipated by Jewell et al.

Dependent Claim 18

Claim 18 claims "wherein the solid particles are moved in the solid transport direction at a rate which is significantly larger than a rate of mixing of the solid particles in the solid transport direction." Claim 18 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 18 is patentable over Jewell et al.

In addition, as described above, preferably the Appellant's process provides for "the solid particles (28) to move along the length of the reactor (20) in uniform plugs that are well mixed in the radial direction. Since every solid particle (28) has the same horizontal velocity, there can be no mixing along the length of the reactor (20)." Thus, the solids residence time distribution "approaches the plug-flow ideal since the bulk rate of solids flow along the length of the fluid bed (30) is much larger than the rate of solids mixing in the same direction."

It is respectfully submitted that although Jewell et al may discuss varying the solids residence time in the drum, Jewell et al provides limited guidance or direction regarding the desired residence time to be achieved. Specifically, Jewell el al simply states that the "time of residence of the coke particles in the fluid bed in drum 19 is sufficient to provide the soaking time required to complete the coking of the residual hydrocarbons deposited on the coke particles and the evolution of hydrocarbons released by the coking reaction" (Column 5, lines 35 - 39 of Jewell et al).

It is therefore respectfully submitted that Jewell et al does not disclose, describe or suggest the limitation of dependent Claim 18, with the result that dependent Claim 18 is patentable over Jewell et al.

Dependent Claims 19 - 21

Claims 19 to 21 further define the liquid feed material. Claims 19 to 21 depend directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claims 19 to 21 are also not anticipated by Jewell et al.

Dependent Claim 22

Claim 22 further defines the solid particles as being comprised of "an amount of a catalyst which is suitable for use in converting the liquid feed material into the vapor phase product." Claim 22 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 22 is also not anticipated by Jewell et al.

Further, it is submitted that Jewell et al does not discuss in any manner the solid particles being comprised of a catalyst. In this regard, the Examiner refers to Column 1, lines 46 - 49 and Column 5, lines 14 - 24 and 36 - 40 of Jewell et al. However, upon reviewing these portions of Jewell et al, it is submitted that Jewell et al does not discuss the use of a catalyst.

More particularly, in Jewell et al, the solid particles are interchangeably described as "hot finely divided coke" or "hot coke" or "hot coke particles". It is respectfully submitted that the solid particles which are contemplated in Jewell et al are not comprised of a catalyst as contemplated by the Appellant at page 14, lines 24-28 of the Specification.

As well, the Examiner states that "the hot particles of Jewell act as a catalyst in the coking reaction and conversion of the liquid feed material into vapor phase product." Thus, the Examiner states that the hot particles act as the catalyst. However, the "hot particles" referred to by the Examiner are in fact the "solid particles." Accordingly, it appears that the Examiner is indicating that the solid particles act as their own catalyst, or that no catalyst is required as the hot particles are sufficient on their own. In either event, it is submitted that Jewell et al does not teach the solid particles being comprised of an amount of a catalyst.

Dependent Claim 23

Claim 23 further defines the step of collecting the vapor phase product. Claim 23 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 23 is also not anticipated by Jewell et al.

Dependent Claim 24

Claim 24 defines the composition of the vapor phase product and provides that "the composition of the vapor phase product varies amongst the vapor phase product collection locations." Claim 24 depends indirectly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted both that dependent Claim 24 is also not anticipated by Jewell et al and that dependent Claim 24 is patentable over Jewell et al.

Dependent Claim 25

Claim 25 defines the process as further comprising "the step of collecting a vaporized fraction of the liquid feed material at a vapor phase product collection location which is adjacent to the feed zone." Claim 25 depends directly from independent Claim 26, which the Appellant has shown not to be anticipated by Jewell et al. For at least this reason, it is submitted that dependent Claim 25 is also not anticipated by Jewell et al.

Further, in the Appellant's claimed process, the liquid feed material (40) is converted into the vapor phase product (44) and the vapor phase product (44) is collected by the vapor collection apparatus (46), as shown in Figure 1. Further, a vaporized fraction (51) of the liquid feed material is collected at a vapor phase collection location (50). The vapor phase collection location (50) is adjacent the feed zone (62), being the location at which the liquid feed material (40) is introduced directly into the fluid bed (30).

It is submitted that Jewell et al does not disclose or describe a vapor phase product collection location which is adjacent to the feed zone. The Examiner refers to vapor product outlet lines (49) of Jewell et al as disclosing this feature. However, the outlet lines (49) for the drum (19) are spaced along the length of the drum (19) for removing the "volatile products of the

process" (Column 9, lines 17 - 24 of Jewell et al). Accordingly, the lines (49) are not adjacent the "feed zone" for the liquid feed material. Further, the lines (49) are provided for the "vapor phase product" and not a "vaporized fraction of the liquid feed material."

(f) Conclusions

For the reasons set out above, it is respectfully submitted that the Examiner's rejection of Claims 2 - 26 in the non-Final Office Action dated July 8, 2010 was erroneous and a reversal of the Examiner's decision in the non-Final Office Action is respectfully requested.

More specifically, it is respectfully submitted that independent Claim 26 is patentable, and allowance of independent Claim 26 is respectfully requested.

Dependent Claims 2-25 all depend directly or indirectly from independent Claim 26. It is further respectfully submitted that dependent Claims 2-25 are patentable on the basis of the distinctions defined therein and on the basis of the patentability of independent Claim 26. Allowance of dependent Claims 2-25 is therefore also respectfully requested.

Respectfully submitted,

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8. CLAIMS APPENDIX

1. (Cancelled)

2. (Previously Presented) The process as claimed in claim 26, further comprising the step of collecting the solid particles.

3. (Previously Presented) The process as claimed in claim 2 wherein the step of collecting the solid particles is comprised of collecting the solid particles at the downstream horizontal position.

4. (Original) The process as claimed in claim 3, further comprising the step of regenerating the solid particles for re-use after collecting the solid particles.

5. (Original) The process as claimed in claim 4 wherein the step of regenerating the solid particles is comprised of heating the solid particles.

6. (Original) The process as claimed in claim 5 wherein the step of regenerating the solid particles is comprised of heating the solid particles to the conversion temperature.

7. (Previously Presented) The process as claimed in claim 26 wherein the step of moving the solid particles in the substantially horizontal solid transport direction consists essentially of moving the solid particles under the influence of gravity.

8. (Original) The process as claimed in claim 7 wherein the upstream horizontal position is at a higher elevation than the downstream horizontal position so that the solid particles move in the solid transport direction from the upstream horizontal position to the downstream horizontal position under the influence of gravity.

9. (Previously Presented) The process as claimed in claim 26 wherein the step of providing the fluid bed is comprised of introducing the fluidizing medium to the fluid bed at a lower vertical position below the solid particles so that the fluidizing direction is substantially upward.

10. (Previously Presented) The process as claimed in claim 26 wherein the step of introducing the liquid feed material directly to the fluid bed at the feed zone is comprised of spraying the liquid feed material so that the liquid feed material contacts the solid particles as droplets.

11. (Original) The process as claimed in claim 10 wherein the liquid feed material is sprayed within the fluid bed so that the droplets penetrate the fluid bed.

12. (Original) The process as claimed in claim 10 wherein the liquid feed material is sprayed so that the droplets contact the solid particles from a spraying direction which is substantially perpendicular to the solid transport direction.

13. (Original) The process as claimed in claim 10 wherein the spraying direction is a substantially vertical direction.

14. (Original) The process as claimed in claim 13 wherein the spraying direction is substantially opposite to the fluidizing direction.

15. (Previously Presented) The process as claimed in claim 26, further comprising the step of quenching the vapor phase product after collecting the vapor phase product in order to minimize further conversion of the vapor phase product.

16. (Previously Presented) The process as claimed in claim 26, further comprising the step of collecting the fluidizing medium with the vapor phase product at an upper vertical position above the solid particles.

17. (Original) The process as claimed in claim 16, further comprising the step of separating the fluidizing medium and the vapor phase product after collecting the fluidizing medium and the vapor phase product.

18. (Previously Presented) The process as claimed in claim 26 wherein the solid particles are moved in the solid transport direction at a rate which is significantly larger than a rate of mixing of the solid particles in the solid transport direction.

19. (Previously Presented) The process as claimed in claim 26 wherein the liquid feed material is comprised of liquid hydrocarbon.

20. (Previously Presented) The process as claimed in claim 26 wherein the liquid feed material is comprised of a heavy hydrocarbon.

21. (Previously Presented) The process as claimed in claim 26 wherein the liquid feed material is comprised of heavy oil or a heavy fraction of a crude oil.

22. (Previously Presented) The process as claimed in claim 26 wherein the solid particles are comprised of an amount of a catalyst which is suitable for use in converting the liquid feed material into the vapor phase product.

23. (Previously Presented) The process as claimed in claim 26 wherein the step of collecting the vapor phase product is comprised of collecting the vapor phase product at a plurality of vapor phase product collection locations spaced horizontally between the upstream horizontal position and the downstream horizontal position.

24. (Original) The process as claimed in claim 23 wherein the vapor phase product has a composition and wherein the composition of the vapor phase product varies amongst the vapor phase product collection locations.

25. (Previously Presented) The process as claimed in claim 26, further comprising the step of collecting a vaporized fraction of the liquid feed material at a vapor phase product collection location which is adjacent to the feed zone.

26. (Previously Presented) A process for converting a liquid feed material into a vapor phase product comprising the following steps:

(a) providing a fluid bed comprising solid particles and a fluidizing medium, wherein providing the fluid bed is comprised of introducing the solid particles to the fluid bed at an upstream horizontal position in the fluid bed, wherein providing the fluid bed is further comprised of introducing the fluidizing medium to the fluid bed so

that the fluidizing medium is moving in a substantially vertical fluidizing direction, and wherein the solid particles are at a conversion temperature which is suitable for facilitating the conversion of the liquid feed material to the vapor phase product;

(b) moving the solid particles in a substantially horizontal solid transport direction from the upstream horizontal position to a downstream horizontal position;

(c) introducing the liquid feed material directly to the fluid bed, separately from the solid particles and separately from the fluidizing medium, at a feed zone located between the upstream horizontal position and the downstream horizontal position in order to facilitate the conversion of the liquid feed material into the vapor phase product;

(d) maintaining the solid particles as fluidized solid particles in the feed zone by introducing the fluidizing medium to the fluid bed in the feed zone; and

(e) collecting the vapor phase product.

9. EVIDENCE APPENDIX

No evidence is included with this Appellant's Brief.

10. RELATED PROCEEDINGS APPENDIX

There are no related proceedings, with the result that no decisions of related proceedings are included with this Appellant's Brief.